What is claimed is:

1. In a telemetric knee prosthesis adapted to measure forces transmitted across the knee joint, the knee prosthesis having a femoral component, a tibial bearing member in articulating contact with the femoral component, a tibia engaging member and a tibial tray engaged to the tibial bearing member and the tibia engaging member, the tibial tray comprising:

an upper plate having a portion configured for engaging the tibial bearing member;

a lower plate having a portion configured for engaging the tibia engaging member, said lower plate spaced apart from said upper plate and defining a plurality of cavities opening away from said upper plate, each of said cavities including a diaphragm adapted to flex when subjected to a load normal to the diaphragm;

a plurality of support posts, each connected between said upper plate and said diaphragm of a corresponding one of said cavities, wherein said support posts are circular in cross-section; and

a force sensing element disposed within each of said plurality of cavities and operable to produce an output signal in response to flexing of said diaphragm.

2. The tibial tray of claim 1, wherein said support posts each have a diameter of about 5.0 mm.

3. The tibial tray of claim 1, wherein said support posts each have a diameter that is about 1/3 the diameter of the corresponding cavity.

4. In a telemetric knee prosthesis adapted to measure forces transmitted across the knee joint, the knee prosthesis having a femoral component, a tibial bearing member in articulating contact with the femoral component, a tibia engaging member and a tibial tray engaged to the tibial bearing member and the tibia engaging member, the tibial tray comprising:

an upper plate having a portion configured for engaging the tibial bearing member;

a lower plate having a portion configured for engaging the tibia engaging member, said lower plate spaced apart from said upper plate and defining a plurality of cavities opening away from said upper plate, each of said cavities including a diaphragm adapted to flex when subjected to a load normal to the diaphragm;

a plurality of support posts, each connected between said upper plate and said diaphragm of a corresponding one of said cavities; and

a force sensing element disposed within each of said plurality of cavities and operable to produce an output signal in response to flexing of said diaphragm, said force sensing element including four pairs of radially aligned strain gages, the strain gages of each pair arranged to measure differential strain in a radial direction,

wherein said lower plate defines a plane parallel to the sagittal plane of the knee joint when the knee prosthesis is implanted therein, and

wherein each of said pairs of strain gages is aligned in a radial plane that is at about 45 degrees relative to said parallel plane.

5. In a telemetric knee prosthesis adapted to measure forces transmitted across the knee joint, the knee prosthesis having a femoral component, a tibial bearing member in articulating contact with the femoral component, a tibia engaging member and a tibial tray engaged to the tibial bearing member and the tibia engaging member, the tibial tray comprising:

an upper plate having a portion configured for engaging the tibial bearing member;

a lower plate having a portion configured for engaging the tibia engaging member, said lower plate spaced apart from said upper plate and defining a plurality of cavities opening away from said upper plate, each of said cavities including a diaphragm adapted to flex when subjected to a load normal to the diaphragm, said lower plate further defining a central cavity disposed between

said plurality of cavities and a plurality of wiring channels, each communicating between a corresponding one of said plurality of cavities and said central cavity;

a plurality of support posts, each connected between said upper plate and said diaphragm of a corresponding one of said cavities;

a force sensing element disposed within each of said plurality of cavities and operable to produce an output signal in response to flexing of said diaphragm;

a circuit element disposed in said central cavity for processing said output signal from said force sensing element in each of said plurality of cavities; and

wiring electrically connecting each force sensing element in said plurality of cavities to said circuit element to transmit said output signal, said wiring disposed in a corresponding one of said plurality of wiring channels,

wherein said lower plate defines a plane parallel to the sagittal plane of the knee joint when the knee prosthesis is implanted therein, and

wherein each of said plurality of wiring channels is aligned at about 45 degrees relative to said parallel plane.

6. In a telemetric knee prosthesis adapted to measure forces transmitted across the knee joint, the knee prosthesis having a femoral component, a tibial bearing member in articulating contact with the femoral component, a tibia engaging member and a tibial tray engaged to the tibial bearing member and the tibia engaging member, the tibial tray comprising:

an upper plate having a portion configured for engaging the tibial bearing member;

a lower plate having a portion configured for engaging the tibia engaging member, said lower plate spaced apart from said upper plate and defining a plurality of cylindrical cavities opening away from said upper plate, each of said cavities including a circular diaphragm adapted to flex when subjected to a load normal to the diaphragm and an outer wall;

a plurality of support posts, each connected between said upper plate and said diaphragm of a corresponding one of said cavities; and

a force sensing element disposed within each of said plurality of cavities and operable to produce an output signal in response to flexing of said diaphragm, said force sensing element including four pairs of radially aligned strain gages, the strain gages of each pair arranged to measure differential strain in a radial direction and includes an inner gage mounted on said diaphragm adjacent the center of said circular diaphragm and an outer gage mounted on said diaphragm immediately adjacent said outer wall of said cylindrical cavity.

7. The tibial tray of claim 6, wherein said inner gage is mounted on said diaphragm at a radius of about 2.5 mm from the center of said circular diaphragm.

8. The tibial tray of claim 6, wherein said circular diaphragm exhibits a micro-strain behavior under load that produces a maximum magnitude at a radial location from the center of said circular diaphragm, and further wherein said inner gage is positioned to span said maximum magnitude radial location.

9. The tibial tray of claim 6, wherein said circular diaphragm exhibits a micro-strain behavior under load that produces a zero-crossing point between the center of said circular diaphragm and said outer wall of said cylindrical cavity, and further wherein said outer gage is positioned between said zero-crossing point and said outer wall.

10. The tibial tray of claim 9, wherein said circular diaphragm exhibits a micro-strain behavior under load that produces a negative maximum magnitude at a radial location between said zero-crossing point and said outer wall, and further wherein said outer gage is positioned to span said negative maximum magnitude radial location.

11. The tibial tray of claim 9, wherein said circular diaphragm further exhibits a micro-strain behavior under load that produces a positive maximum

magnitude at a radial location from the center of said circular diaphragm, and further wherein said inner gage is positioned to span said positive maximum magnitude radial location.

12. In a telemetric knee prosthesis adapted to measure forces transmitted across the knee joint, the knee prosthesis having a femoral component, a tibial bearing member in articulating contact with the femoral component, a tibia engaging member and a tibial tray engaged to the tibial bearing member and the tibia engaging member, the tibial tray comprising:

an upper plate having a portion configured for engaging the tibial bearing member;

a lower plate having a portion configured for engaging the tibia engaging member, said lower plate spaced apart from said upper plate and defining a plurality of cavities opening away from said upper plate, each of said cavities including a diaphragm adapted to flex when subjected to a load normal to the diaphragm, said lower plate further defining a central cavity disposed between said plurality of cavities and a plurality of wiring channels, each communicating between a corresponding one of said plurality of cavities and said central cavity;

a plurality of support posts, each connected between said upper plate and said diaphragm of a corresponding one of said cavities;

a force sensing element disposed within each of said plurality of cavities and operable to produce an output signal in response to flexing of said diaphragm said force sensing element including four pairs of radially aligned strain gages, the strain gages of each pair arranged to measure differential strain in a radial direction;

a circuit element disposed in said central cavity for processing said output signal from said force sensing element in each of said plurality of cavities; and

wiring electrically connecting each force sensing element in said plurality of cavities to said circuit element to transmit said output signal, said wiring disposed in a corresponding one of said plurality of wiring channels,

wherein none of said four pairs of radially aligned strain gages is aligned with said wiring channel communicating with said corresponding one of said plurality of cavities.

13. The tibial tray of claim 12, wherein said four pairs of radially aligned strain gages are aligned at an angle of about 45 degrees or 135 degrees relative to said wiring channel.